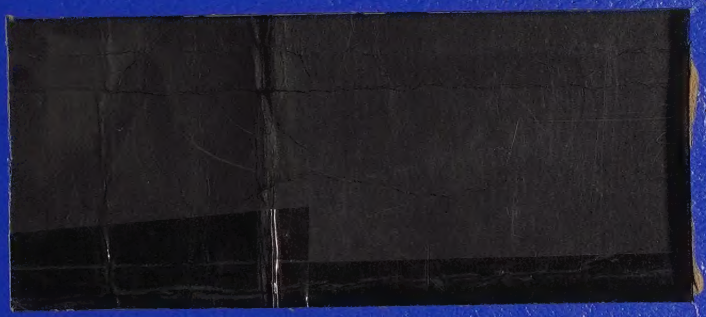
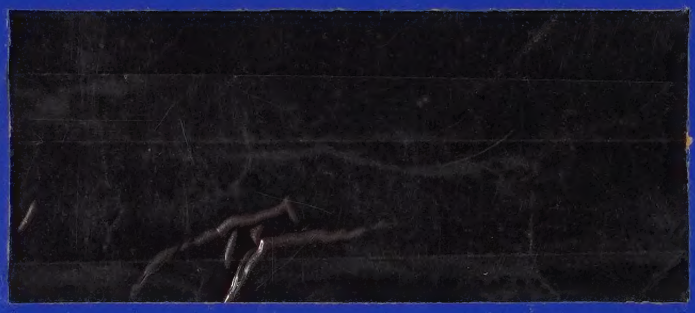
DATA CONTROL





INSTRUCTION MANUAL
MODULE ASSEMBLY
DCS MODEL GMA-1

Type 1036

This material is the property of Data-Control Systems, Inc. It is furnished for installation and operation of DCS products only, and its reproduction or use in any other way or for any commercial purpose without prior permission is forbidden. All rights in this material are reserved.

DATA-CONTROL SYSTEMS, INC
EAST LIBERTY STREET
DANBURY, CONNECTICUT

TABLE OF CONTENTS

SECTION		PAGE
I	INTRODUCTION.	1-1
	1-1. Scope and Contents	1-1
	1-4. Purpose of Equipment.	1-1
	1-6. Description of Equipment	1-1
	1-10. Detailed Circuit Description.	1-2
II	OPERATION AND SERVICE INFORMATION	2-1
	2-1. Introduction.	2-1
	2-3. Operating Principles	2-1
	2-5. Receiving and Shipping Instructions	2-1
	2-8. Operating Procedure	2-1
	2-12. Periodic Lubrication	2-2
	2-14. Periodic Inspection.	2-2
	2-18. Performance Test	2-2
	2-21. Maintenance	2-2
	2-23. Troubleshooting	2-3
III	REPAIR INSTRUCTIONS	3-1
	3-1. Introduction	3-1
	3-3. Special Tools	3-1
	3-5. Disassembly.	3-1
	3-7. Repair.	3-2
	3-9. Reassembly	3-2
	3-10. Testing after Reassembly	3-2

Digitized by the Internet Archive
in 2025

https://archive.org/details/manualsplus_10483

TABLE OF CONTENTS (Continued)

IV TABLES AND DIAGRAMS

2-1. Pin Connections 4-1

2-2. Voltages 4-2

2-3. Wiring Diagram . . . . . Attached

DRAWINGS

Drawing Number	Title	Page
DO-008954	Outline Drawing (115VAC)	4-6
CW-009290	Schematic (115 VAC)	4-7

OR

DO-010433	Outline Drawing (28 VDC)	4-6
CW-010432	Schematic (28 VDC)	4-7

SECTION I
INTRODUCTION

1-1. SCOPE AND CONTENTS

1-2. SCOPE. This publication describes and gives instructions for operating, servicing, and repairing the Module Assembly, DCS Model GMA-1 (figure 1-1). The Module Assembly is an item of ground support equipment for a radio telemetry system. It is manufactured by Data-Control Systems, Inc., Danbury, Connecticut.

1-3. CONTENTS. The purpose of the Module Assembly and a physical, electrical, and functional description of it are given in section I. Section II contains the operating principles of the Module Assembly, shipping and receiving instructions, and servicing and troubleshooting instructions. Section III contains instructions for disassembly, repair, and reassembly of the Module Assembly.

1-4. PURPOSE OF EQUIPMENT

1-5. The Module Assembly, DCS Model GMA-1 is a means of supporting 14 UNIDAP modules in position in a 19-inch RETMA rack. The Module Assembly contains a power supply to power the UNIDPA modules and connectors for signal leads, power leads, and intermodular connections.

1-6. DESCRIPTION OF UNIT

1-7. The FMA-1 Module Assembly provides mounting space for up to 14 single modules or seven double modules or any combination thereof. The unit includes individual coaxial connectors for each of the modules and flexible provisions for interconnections between modules. Six power supply voltages are provided in the unit so that a wide variety of modules can be accommodated.

1-8. The modular units fit into the forward 10 inches of the unit. The power supplies and a blower assembly occupy the rear section. The unit is designed to permit ready access to the master connector assembly for custom interconnection of units. Power supplies are connected to all modular connectors so that all units are provided with the available voltages. Separate shielded connections are provided for each module position. These shielded inputs appear at the same connector pins on all modules.

1-10. DETAILED CIRCUIT DESCRIPTION

1-11. INPUT. The input of the power supply uses a power transformer T101 and full-wave bridge furnishing 28 volts dc (nominal) to the regulator. The output from the regulator feeds dc to dc converter toroid T301, causing transistors Q501 and Q502 to conduct alternately at the rate of 2000 cps (nominal). The secondary windings of the toroid feed full-wave bridge rectifiers and produce 12, 18, and 35 volts respectively. The 35-volt output is fed back to the regulator as a control voltage.

1-12. REGULATOR. If the control voltage is too high, the base of transistor Q301, into which it is fed, tends to rise above the emitter voltage, which is pegged by zener diode CR315, causing Q301 to conduct harder. The Q301 collector current through R304 causes a potential difference which causes transistor Q503 to conduct harder. The Q503 collector current flows at R308, causing the potential of the base of transistor Q504 to rise, tending to turn off the collector of Q504 which lowers the input voltage to the dc to dc converter, thereby lowering the 35-volt output. If the output of the 35-volt supply is too low, the action is the reverse of the above.

1-13. DC TO DC CONVERTER. The dc to dc converter system is used as a protective measure. Any overload in any of the output circuits (up to and including a dead short) will cause the switching transistors Q502 and Q501 to stop oscillating, thereby cutting off voltages to all output circuits.

SECTION II

OPERATION AND SERVICE INSTRUCTIONS

2-1. INTRODUCTION

2-2. This section contains the operating procedures; receiving and shipping instructions; and checkout, troubleshooting, and maintenance instructions for the Module Assembly, DCS Model GMA-1.

2-3. OPERATING PRINCIPLES

2-4. The DCS Model GMA-1 Module Assembly fits into a standard 19-inch RETMA rack, providing mounting space for up to 14 single UNIDAP modules, and supplying power and interconnections between modules.

2-5. RECEIVING AND SHIPPING INSTRUCTIONS

2-6. RECEIVING. The Model GMA-1 is shipped by air, rail, or truck. Upon receipt of the equipment, open the corrugated outer container, remove the corrugated inner packing, and remove the plastic moisture barrier from the Module Assembly.

2-7. SHIPPING. If it becomes necessary to reship the unit, use the original container wherever possible; if the original container is not available, pack securely in corrugated material with a corrugated outer container.

2-8. OPERATING PROCEDURE

2-9. INSTALLATION. The Model GMA-1 is installed in a standard 19-inch RETMA rack and secured by four screws. The UNIDAP modules all plug into, and receive their power from, the Model GMA-1.

2-10. COOLING. The DCS Model GMA-1 Module Assembly is equipped with its own venturi fan for cooling. The fan pressurizes the unit to approximately 0.2 inch of water, forcing the cooling air to flow over the components. Cooling is such that each Model GMA-1 Module Assembly may be operated either in or out of the rack and still maintain its proper temperature, as long as the ambient temperature does not exceed 40°C.

2-11. ELECTRICAL CONNECTIONS. All signal and power connections are brought in through the rear of the Model GMA-1 to connectors which mate with the connectors which mate with the connectors on the rear of the UNIDAP modules.

2-12. PERIODIC LUBRICATION

2-13. If the UNIDAP modules tend to stick in their tracks, apply a coating of spray-type Teflon (Fluoro -- Chemplast, Inc., Newark, N. Y.). Lubricate venturi fan every six months.

2-14. PERIODIC INSPECTION

2-15. WEEKLY. Perform a visual inspection at least once a week, checking the following items:

Adequacy of cooling air
Evidence of overheating
Loose or defective wiring
Loose components or subassemblies
Rust or corrosion

2-16. SEMI-ANNUAL. Check the following items upon installation and at least every six months thereafter:

Adequacy of cooling air
Evidence of overheating
Loose or defective wiring
Evidence of overheating on each printed circuit board
Waveforms
Voltages
General Performance

2-17. MONTHLY. In addition to the weekly inspections, a monthly inspection should be performed in accordance with tables 2-3 and 2-4.

2-18. PERFORMANCE TEST

2-19. Performance testing of the Model GMA-1 should be a go-no go type of test. With all UNIDAP units plugged in, check the UNIDAP units as shown in their individual instruction books.

2-20. If the UNIDAP units fail to pass the test as in paragraph 2-19 above, localize the trouble within the unit and repair.

2-21. MAINTENANCE

2-22. Periodic maintenance, aside from the inspections described in this section, is not a requirement.

2-23. TROUBLESHOOTING

2-24. PRELIMINARY. When normal diagnosis localizes a trouble in the GMA-1, check to insure that the trouble is in the GMA and not in one of the UNIDAP modules.

2-25. PROCEDURE. The isolation of a faulty component in the DCS Model GMA-1 will be the result of intelligent application of the schematic diagram and a throough understanding of the circuit description and block diagram. See table 2-2 and drawing number for voltages.

NOTE

The Modular Blank, DCS Model GMB-1 is equipped with a connector capable of mating with the main connector in the GMA-1. Any item of the proper size may be built into one of these blanks with appropriate input, output, and power leads brought in through the rear.

SECTION III

REPAIR INSTRUCTIONS

3-1. INTRODUCTION

3-2. This section contains the necessary instructions for disassembly, repair, and reassembly of the Module Assembly, DCS Model GMA-1.

3-3. SPECIAL TOOLS

3-4. No special tools are required to disassembly and reassemble the Model GMA-1.

CAUTION

Be sure to observe the usual precautions when making repairs. Observe polarity on electrolytic capacitors and on diodes. Do not use more heat than absolutely necessary when soldering on the printed circuit wiring. When soldering leads on transistors or diodes, hold the component body and the heated joing being soldered so that heat of soldering is drawn away from the semiconductor. Remove excess solder flux. Make sure all circuit boards are firmly seated in their retaining clips and that all interconnecting terminals are properly mated.

3-5. DISASSEMBLY

3-6. Disassembly of the GMA-1 for repairs consists of loosening the captive knurled screw located at the lower left hand corner of the GMA-1 panel, then removing the unit. Remove the screws on the upper and lower tracks and separate the two halves of the unit.

3-7. REPAIR

3-8. The repair of the Model GMA-1 is limited to parts replacement. Perform the troubleshooting procedures as described in paragraph 2-23, as necessary to determine which components should be reused and which should be replaced.

3-9. REASSEMBLY

3-10. When replacing components, be sure to allow sufficient clearance to permit normal use.

3-11. TESTING AFTER REASSEMBLY

3-12. After reassembly of the unit and visual inspection, test as shown in table 2-2. Upon successful completion of this test, the unit is ready for operation.

SECTION IV
TABLES & DIAGRAMS

Table 2-1. Pin Connections

J-15 Connections		Master Plug-In Board	
Pin	Description	Pin	Description
1	NC	1	Shielded Pair Lead (In)
2	NC	2	Shielded Pair Lead (In)
3	NC	3	+35 VDC
4	NC	4	+12 VDC
5	NC	5	Ground
6	NC	6	Summing Bus
7	NC	7	-12 VDC
8	NC	8	-35 VDC
9	NC	9	+18 V Unreg.
10	NC	10	-18 V Unreg.
11	NC	11	See Module Outline Drawing
12	NC	12	See Module Outline Drawing
13	NC	13	See Module Outline Drawing
14	NC	14	See Module Outline Drawing
15	NC	15	See Module Outline Drawing
16	NC	16	See Module Outline Drawing
17	NC	17	See Module Outline Drawing
18	115 VAC Line	18	See Module Outline Drawing
19	115 VAC Line	19	Coax. Sig. Lead (Out)
20	NC	20	Ground
21	NC		
22	NC		NOTE: Pins are numbered top to bottom.
23	NC		
24	NC		

Rear Module Connectors

	Output	Input
M-1	JO-1	JI-1
M-2	JO-2	JI-2
M-3	JO-3	JI-3
M-4	JO-4	JI-4
M-5	JO-5	JI-5
M-6	JO-6	JI-6
M-7	JO-7	JI-7
M-8	JO-8	JI-8
M-9	JO-9	JI-9
M-10	JO-10	JI-10
M-11	JO-11	JI-11
M-12	JO-12	JI-12
M-13	JO-13	JI-13
M-14	JO-14	JI-14

NOTE:
1 - Input Connectors are Deutsch #DM 9601-3P; Mating Connectors are DM9717-3S or DM9702-3S. Use Hi-Temp #22 Code #2TxB-22-1934 for connections to Input Connector.

2 - Output Connectors are UG-698/U; Mating Connectors are UG-692/U. Use RG-62/U Coaxial Cable for connections to Output Connectors.

FOR USE WITH BNC TERMINATED CABLES, USE ADAPTOR UG-690/U.

Table 2-2. Voltages

Point	VDC
Emitter Q503 (to ground)	28
Coll - Q503	25
Across R304	7
Base Q301	7
Coll Q504	22

Table 2-3. Periodic Inspections of Electrical Components

Item	Time Interval (Days)	Procedure
Connectors	30	Check all connectors for bent pins or distorted barrels, broken or missing pins or barrels, corrosion or fungus growth on pins or barrels, broken or discolored inserts, stripped threads and damaged potting compound. Check bulkhead connectors for loose mountings. Clean pins or barrels which have a light fungus growth or which are slightly corroded. Tighten mountings of loose bulkhead connectors. Replace any connector containing bent, distorted, missing, or broken pins. If connector is part of a cable, replace entire cable.
Terminal boards	30	Check for loose, damaged, or missing terminal screws and for broken wiring to the terminal boards. Check terminal boards and nameplates for loose mounting, for broken or missing parts, and for other visible damage. Tighten loose terminal screws and mountings. Replace damaged or missing parts.
Resistor and capacitor assemblies	30	Check resistor and capacitor assemblies for defective connections, discoloration, cracks, splits, or bulges. Repair defective connections. Replace defective plug-in assemblies.

Table 2-3. Periodic Inspections of Electrical Components (Continued)

Item	Time Interval (Days)	Procedure
Power transformers, rectifiers, resistors and capacitors	30	Check power transformers, damaged resistors, and capacitors for defective solder connections, discoloration, cracks, splits, or bulges. Replace any parts found to be defective.
Complete equipment	30	Check for secure installation and for loose bent, broken, or missing installation parts. Tighten loose parts. Straighten slightly bent parts. Clean equipment.
All exterior components	30	Check all exterior components for loose, missing, or damaged parts. Tighten loose parts. Replace missing or damaged parts.
All interior components	30	Check all interior components for loose, missing, or damaged parts. Tighten loose parts. Replace missing or damaged parts.
Power switch	30	Operate toggle switch to check for return action, loose mountings, and ease of operation. Check for visible defects. Tighten loose mountings. Replace any defective switch.
Selector switches	30	Operate all selector switches to check for ease of operation. Check for loose mountings and for secure wiring connections. Check for sign of arcing or overheating, and for other visible damage. Tighten loose mountings. Replace selector switch if other defects are detected.

Table 2-3. Periodic Inspections of Electrical Components (Continued)

Item	Time Interval (Days)	Procedure
Interlocking pushbutton switches	30	Check each pushbutton for ease of operation, loose mounting, dirt, and for proper latching and release. Check for visible defects. Tighten loose mounting. Replace any defective interlocking pushbutton switch. Clean contacts with blast of clean, dry air at a pressure not greater than 25 psi.
Cables	30	Check all cables for cust, abrasions, kinks, pinches, and loose mountings. Check for loose, damaged or missing cable clamps. Remove all kinks from cables. Replace defective cables.
Wiring and wiring harness	30	Check for frayed insulation, kinks, sharp bends, broken wires, discoloration, pinches and faulty connections. Check for loose, damaged, or missing cable clamps. Check harness lacing for tears, fraying and breaks. Tighten loose cable clamps and replace cable clamps which are damaged or missing. Remove any kinks or sharp bends in wiring or wiring harness. If harness lacing is defective, remove old lacing and replace the harness lacing. Replace wiring or harness if other defects are detected.

Table 2-4. Periodic Inspections of Mechanical Components

Item	Time Interval (Days)	Procedure
Complete equipment	30	Check for damaged, loose, or missing component parts or mountings. Repair or replace damaged or missing parts.
Frame assembly	30	Check for bends and dents and straighten with a machinist's hammer. Check for broken or missing parts and replace defective or missing parts. Check for rust and corrosion and cracked or chipped paint. Remove rust and corrosion with a wire brush and repaint.
Fasteners and handles	30	Check fasteners and handles for loose mounting and damaged or missing parts. Check fasteners for ease of operation. Check for other visible damage. Tighten loose mountings. Replace missing or damaged fastener or handle.
Threaded parts	30	Check for stripped or worn threads. Replace defective parts. Remove rust and corrosion with a wire brush and lubricate bolt hold threads.
Guide pins	30	Check for nicks, burrs, bands, or fractures. Replace if any defects are noted. Check for rust and corrosion. Remove with a wire brush and lubricate.

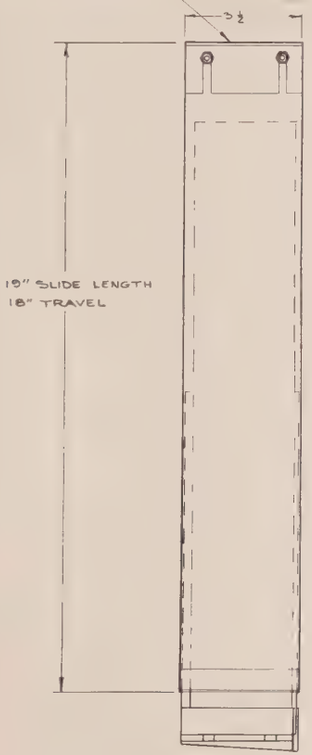
REV	DATE	DESCRIPTION	BY	CK'D	APP'D
01	11/64	CHANGED COIN CODING NOW TO -AAS-2-1 ETC.	[illegible]	[illegible]	[illegible]
02	7-65	#22-133 TO BE 8 AWG #18 WIRE CHG'D WITH 182-8 MTG. PANEL	[illegible]	[illegible]	[illegible]
03	9/65	CA 3094 ADDED NOTE TO INPUT PLUG AND CHANGED DRAWING	[illegible]	[illegible]	[illegible]
04	4-66	CHG'E PER CA 3147	[illegible]	[illegible]	[illegible]
05	11/66	CA 3615 AMPHENOL WAS DEUTSCH	[illegible]	[illegible]	[illegible]
06	7/67	CA 72: CHG'D LETTERING NOMENCLATURE	[illegible]	[illegible]	[illegible]
07	9/68	CA 1000: CHANGED CONNECTOR PART NUMBER	[illegible]	[illegible]	[illegible]
08	11/68	CA 3931: DELETED NOTE PER C.A.	[illegible]	[illegible]	[illegible]

DO-008954

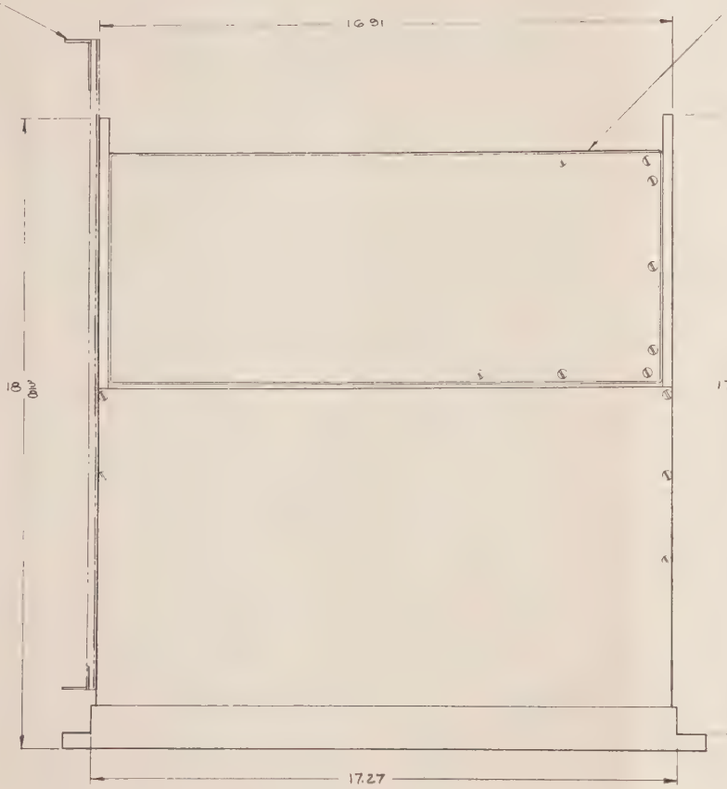
ITEM	SYMBOL	DWG NO.	DESCRIPTION	QTY/ ASSY

GRANT SLIDE, CAT.# 3460 (OPTIONAL NOT SUPPLIED WITH UNIT)

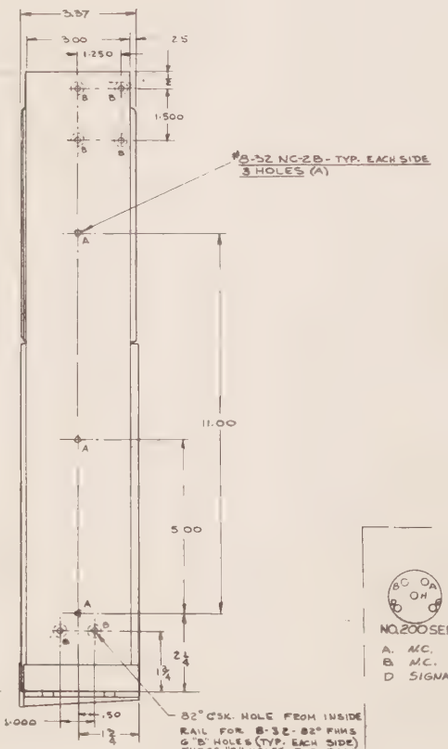
-NOTE-
THIS SLIDE IS SUPPLIED AS STANDARD OPTIONAL EQUIPMENT, ANY OTHER MAKE OR MODEL WILL BE CONSIDERED AS SPECIAL



LEFT SIDE
-WITH OPTIONAL SLIDE-

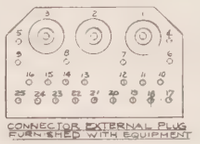


TOP VIEW



RIGHT SIDE
-WITHOUT OPTIONAL SLIDE-

J-15 PIN CONNECTIONS



CONNECTOR EXTERNAL PLUG FURNISHED WITH EQUIPMENT

PIN	DESCRIPTION
1	N.C.
2	
3	N.C.
4	CHASSIS GROUND
5	N.C.
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	N.C.
17	
18	115 V.A.C LINE
19	115 V.A.C LINE
20	N.C.
21	
22	
23	
24	N.C.

MASTER PLUG IN BOARD

PIN	DESCRIPTION
1.	TRIAX. SIG LEAD (IN)
2.	TRIAX. SIG. LEAD (IN)
3.	+35VDC
4.	+12VDC
5.	GROUND
6.	SUMMING BUS
7.	-12VDC
8.	-35VDC
9.	+18V UNREG
10.	-18V UNREG.
11	SEE MODULE OUTLINE DWG.
12	
13	
14	
15	
16	
17	
18	
19.	COAX. SIG. LEAD (OUT)
20.	GROUND

NOTE:
PINS ARE NUMBERED TOP TO BOTTOM

NO. 200 SERIES PLUG

A. M.C.
B M.C.
D SIGNAL
E. SIGNAL
H. SIGNAL GND.

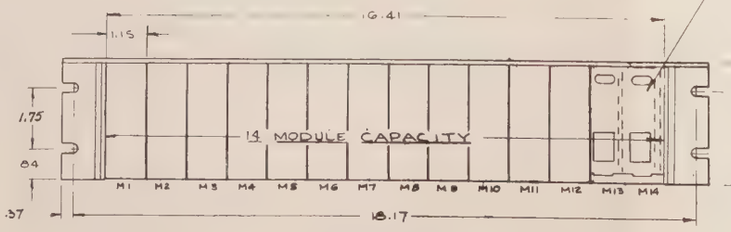
	INPUT OR OUTPUT	OUTPUT OR INPUT
M-1	J330	J201
M-2	J302	J202
M-3	J303	J203
M-4	J304	J204
M-5	J305	J205
M-6	J306	J206
M-7	J307	J207
M-8	J308	J208
M-9	J309	J209
M-10	J310	J 210
M-11	J 311	J 211
M-12	J 312	J 212
M-13	J 313	J 213
M-14	J 314	J 214

NOTE

1) NO. 200 SERIES CONNECTORS ARE AMPHENOL #126-216 . MATING CONNECTOR: IS AMPHENOL #126-223
USE HI-TEMP #22 CODE SYR-22 -1384 FOR CONNECTIONS TO INPUT CONNECTOR

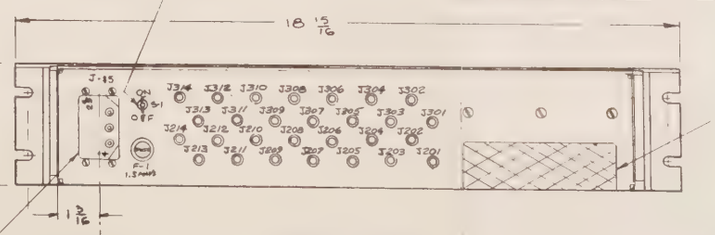
2) NO. 300 SERIES CONNECTORS ARE UG-698/U ; MATING CONNECTORS ARE UG-692/U • USE RG-62/U COAXIAL CABLE FOR CONNECTIONS TO OUTPUT CONNECTORS
FOR USE WITH BNC TERMINATED CABLES USE ADAPTOR UG60/U

MASTER BOARD SEE TABULATION



FRONT VIEW

POWER SWITCH



REAR VIEW

COOLING UNIT INLET

CONNECTOR CANNON DPX-25C3-34P-1A
MATING CONNECTOR DPX-25C3-336-1A
SEE TAB. FOR PIN CONN.

REV	DESCRIPTION	QTY

PRODUCT	NEXT ASSEMBLY	QTY/ ASSY
GMA-1		

DATA CONTROL SYSTEMS, INC.

TITLE: OUTLINE DRAWING MODULE ASSEMBLY MODEL GMA-1

		DATE
DWN	RAT	4-11-64
CHK'D	[illegible]	11/15/64
PROJ. ENG.	[illegible]	11/15/64
CH. ENG.	[illegible]	9/17/64

DO NOT SCALE DRAWING

MAT'L

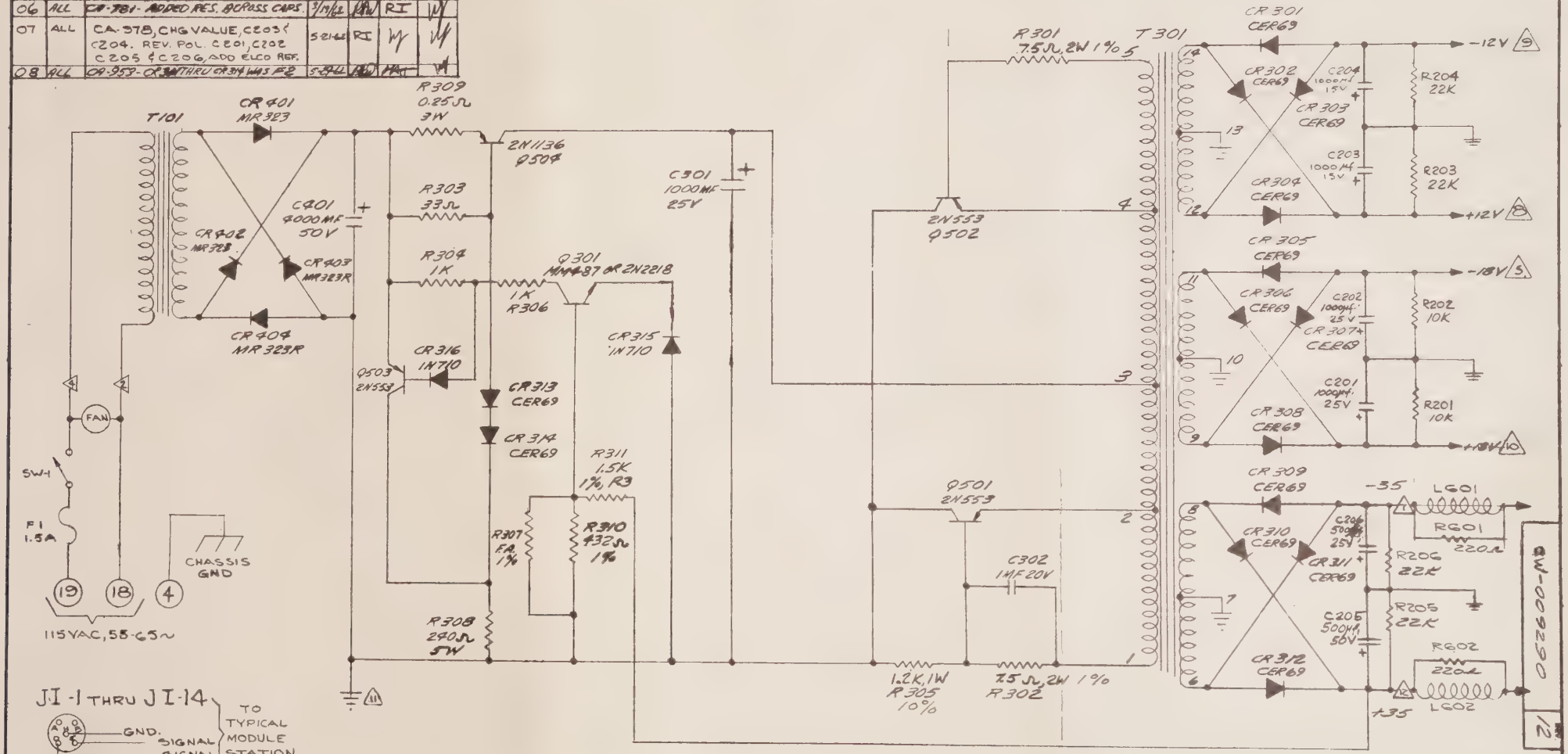
FINISH

SCALE 1/2 X

DO-008954 REV 05

REV	ZONE	DESCRIPTION	DATE	DWN	CHK	APP
01	D7	F1 WAS 1.5 AMP FUSE. CA-482	10/17/61	PRW	WM	
02	D7	F1 WAS 1.5A ; ⑱ & ⑲ WERE ⑦ & ⑧	12/4/61		RI	
03	B1,C1, D1,E1	CA-704-CHG'D SYMBOL CALLOUTS	2/16/62		RI	
04	C5	CA-775-R311 WAS 1/4W VALUE.	3/9/62		RI	
05	B3,E3	CA-777-R304 & R302 WAS 6.8K 1/2W 5%	3/9/62		RI	
06	ALL	CA-781-ADDED RES. ACROSS CAPS.	3/19/62		RI	
07	ALL	CA-378, CHG VALUE, C203 & C204. REV. POL. C201, C202 C205 & C206, ADD ELCO REF.	5/21/62	RI		
08	ALL	09-959-CR314 THRU CR314 WAS F2	5/24/62			
09	C5	CA-7751-R311 WAS 1% RES.	9/8/62	PRW	WM	
10	C1 B1	CA1215 ADD CIRCUIT L601 & RG01, L602 & RG02	9/8/62			
11	~	CA-775-2-CHG'D R310 & R311	11/6/62	PRW	WM	
12	~	CA-1278-CHG'D R301 & R307	4-4-63	PRW	WM	

ITEM	SYMBOL	DWG NO.	DESCRIPTION	QTY. PER



J1-1 THRU J1-14 — TO TYPICAL MODULE STATION
GND.
SIGNAL
SIGNAL

JO-1 THRU JO-14 — FROM TYPICAL MODULE STATION
GND
SIGNAL

NOTE:
1. ALL RESISTORS A-B, 1/2W, 10% UNLESS OTHERWISE NOTED
2. MATING CONNECTOR TO DPX 25C3 34P (J15) IS CONNECTOR DPX-25C3-335 (P15) MARKED ○
3. OUTPUTS APPEAR AT CONNECTOR #RF 11229 (P16) MARKED △
4. THIS SCHEMATIC IS BASIC TO ALL GMA-1/5 UNITS. CONSULT INTERWIRING DIAGRAM FOR SPECIAL WIRING INFORMATION. DWG NO. DW-000434.

REF	DESCRIPTION	QTY

GMA-1/5 — PRODUCT | NEXT ASSEMBLY | QTY. PER

DATA CONTROL SYSTEMS, INC.

TITLE: SCHEMATIC, POWER SUPPLY MODULE ASSY, MODEL GMA-1/5

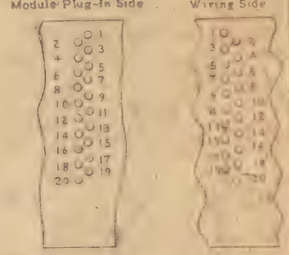
TOLERANCES: UNLESS OTHERWISE SPECIFIED
DECIMAL - 3 PLACE ± .005
DECIMAL - 2 PLACE ± .010
FRAC. ± 1/64 ANG. ± 0°30'
FLATNESS WITHIN ~ /IN.
FRACTIONAL HOLES -0. ± 1/64
NOTE: BREAK ALL SHARP EDGES/IN .005"-.015" SURFACE ROUGHNESS NOT TO EXCEED ▽

		DATE
DWN. PJH		9/14/61
CHKD. RAT		9-20-61
ENG. WMC		9-20-61
APP		9/14/61
SCALE		

DO NOT SCALE DRAWING
MATL
FINISH
CW-009290 REV 12
SHEET

MODULE STATION CONNECTORS

GFD-5 J102 — GFD-5 J103 — GFD-5 J106 — GFD-5 J107 — GFD-5 J110 — GFD-5 J112 — GBP-2 J114



J101 through J114
Elco 20 pin Connector
Mating Connector on Plug-in Module

J201 through J214
Wiring Side
Amphenol #126-215
Mating Connector Amphenol #126-2[illegible]
through

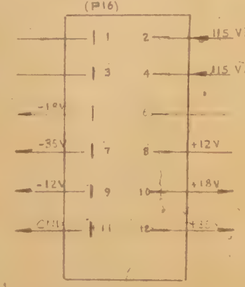
SIGNAL CONNECTORS

DISC. IN. — DISC. IN. — DISC. IN. — DISC. IN. — DISC. IN. — DISC. IN.

Main Connector (J15)

FROM	TO	WIRE
1		
1 (Sh)		
2		
2 (Sh)		
3		
4		#16 BLK
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18	115 VAC	TO F1-1
19	115 VAC	TO S1-4
20		
21		
22		
23		
24		

CONNECTOR VIEW FROM WIRED SIDE (P16)



Elco Connector #RF-11224
(J16) Mating Connector = Elco Printed Circuit Connector on Board

Connector (P16)

TO	WIRE
S1-3	#22 W Blk/Yel
S1-1	#22 Wht Grn Sh
J114-10	#1 Blk
J114-1	Yel
J114-9	Blu
J114-8	Wht
J114-5	P16

REFERENCE DOCUMENTS:
OUTLINE DWG. 60V-3; D0-009567-00

NOTES:

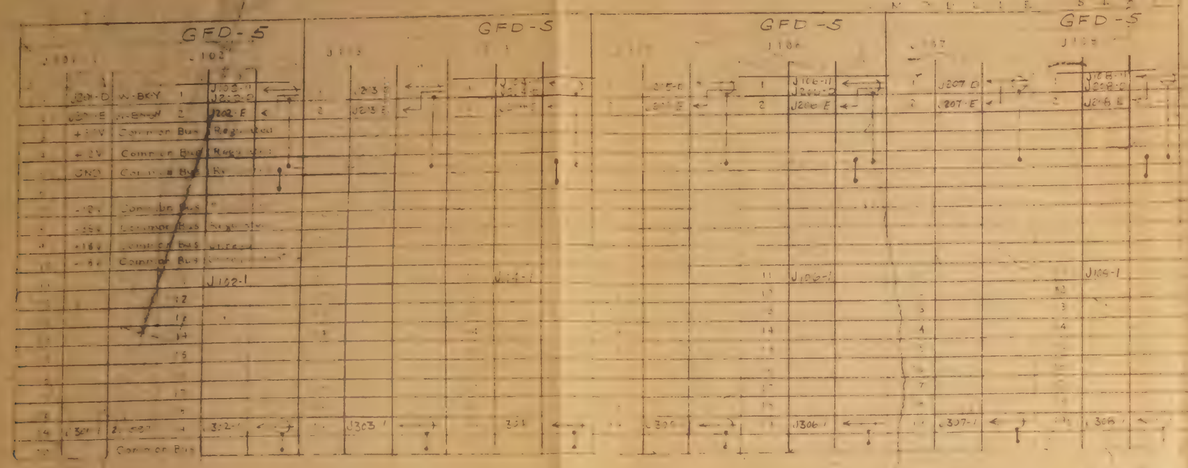
[illegible] WAS FORMERLY J1 + J2

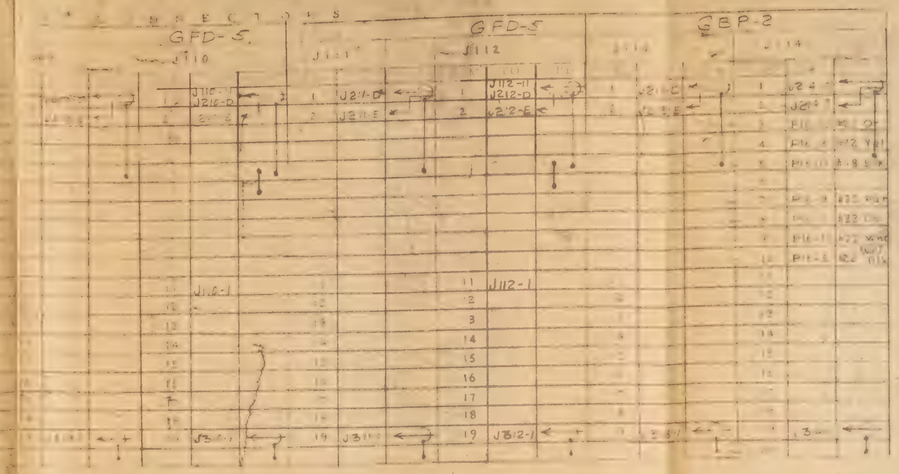
[illegible] TER CONDUCTOR
[illegible] VENDL #21-597 WIRE COAX

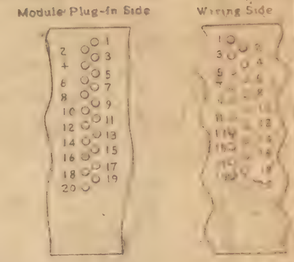
ENTER CONDUCTOR
[illegible] STED SHIELDED PAIR
[illegible] WIRE WITH BLK. JACKET
[illegible] E 2TXR-22-1934 HI-TEMP WIRE
[illegible] -D

AUG 18 1963

DATA CONTROL SYSTEMS, INC.







J101 through J114
Elco 20 pin Connector
Mating Connector on Plug-in Module

J201 through J214
Wiring Side
Amphenol #126-2316
Mating Connector Amphenol #126-22
P1-1 through P1-14

SIGNAL CONNECTORS

J101			J102			J103			J104			J105			J106			J107			J108		
FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE
1	J102-19	TYP.	1	J103-19	TYP.	1	J104-19	TYP.	1	J105-19	TYP.	1	J106-19	TYP.	1	J107-19	TYP.	1	J108-19	TYP.			
2 (Sh)	J102-20	SH.	2 (Sh)	J103-20	SH.	2 (Sh)	J104-20	SH.	2 (Sh)	J105-20	SH.	2 (Sh)	J106-20	SH.	2 (Sh)	J107-20	SH.	2 (Sh)	J108-20	SH.			

DISC. IN. DISC. IN. DISC. IN. DISC. IN.

DISC. OUT DISC. OUT

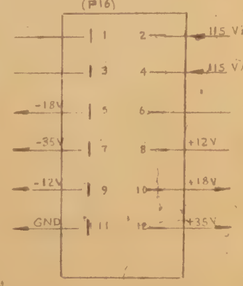
J109			J110			J111			J112			J113			J114		
TO	TYPE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE
J103-19	TYP.	1	J110-19	TYP.															
J103-20	SH.	2 (Sh)	J110-20	SH.															

DISC

Main Connector (J15)

FROM	TO	WIRE
1		
1 (Sh)		
2		
2 (Sh)		
3		
3 (Sh)		
4	GND	#18 BLK
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18	115 VAC	TO F1-1
19	115 VAC	TO S1-4
20		
21		
22		
23		
24		
25		

CONNECTOR VIEW FROM WIRED SIDE (P16)



Elco Connector #RF-11224
(J16) Mating Connector = Elco Printed Circuit Connector on Board

Connector (P16)

TO	WIRE
S1-3	BLK/Yel
S1-1	BLK/Wht
J114-10	Wht/BLK
J114-3	
J114-11	
J114-4	
J114-7	
J114-8	
J114-5	
J114-9	

SIGNAL CONNECTORS

J309			J310			J311			J312			J313			J314		
TO	TYPE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE
J109-19	TYP.	1	J110-19	TYP.															
J109-20	SH.	2 (Sh)	J110-20	SH.															

DISC

REFERENCE DOCUMENTS:

OUTLINE DWG. GOV-3; D0-009567-00

NOTES:

J- J3X SERIES WAS FORMERLY J1 + J2

CENTER CONDUCTOR
AMPHENOL #21-597 WIRE COAX
SHIELD

2 CENTER CONDUCTOR
TWISTED SHIELDED PAIR
#22 WIRE WITH BLK. JACKET
CODE #2TXR-22-1934 HI-TEMP WIRE
SHIELD

AUG 16 1963

TYPE:	1121
MODEL:	GMA-1
SO:	5952

DATA CONTROL SYSTEMS, INC.

WIRING CHART

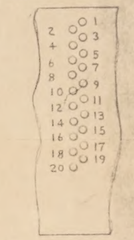
DWG. NO.	DESCRIPTION
	D-V [illegible] C2

NO.	DATE	DESCRIPTION	BY
01	12-26-62	DELETED NOTES 1 & 2 PER ECN 1393-1	GD
02	1-11-63	CONNECTED PINS 5 & 6 ON ALL GFD-5's.	GD

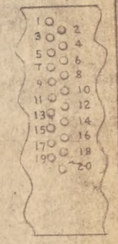
MODULE STATION CONNECTORS

	GFD-5 J101			GFD-5 J102			GFD-5 J103			GFD-5 J104			GFD-5 J105			GFD-5 J106			GFD-5 J107			GFD-5 J108			GFD-5 J109			GFD-5 J110			GFD-5 J111			GFD-5 J112			GMB-1 J113			GMB-1 J114		
FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE
1	J201-D	W-BK-Y	1	J102-11 J202-D		1	J203-D		1	J104-11 J204-D		1	J205-D		1	J106-11 J206-D		1	J207-D		1	J108-11 J208-D		1	J209-D		1	J110-11 J210-D		1	J211-D		1	J112-11 J212-D		1	J213-D		1	J214-D	
2	J201-E	W-BN-GN	2	J202-E		2	J203-E		2	J204-E		2	J205-E		2	J206-E		2	J207-E		2	J208-E		2	J209-E		2	J210-E		2	J211-E		2	J212-E		2	J213-E		2	J214-E	
3	+35V	Common Bus	(Regulated)																																				3	Pin 12	#22 Or
4	+12V	Common Bus	(Regulated)																																				4	Pin 8	#22 Yel
5	GND	Common Bus	(Regulated)							J104-6 J104-5						J106-6 J106-5						J108-6 J108-5						J110-6 J110-5						J112-6 J112-5				5	Pin 11	#18 Blk
6				J102-6 J102-5																																		6	Pin 9	#22 Pur
7	-12V	Common Bus	(Regulated)																																			7	Pin 7	#22 Gy
8	-35V	Common Bus	Regulated																																			8	Pin 10	#22 Wht/Blk
9	+18V	Common Bus	(Unregulated)																																			9	Pin 6	#22 Wht/Yel
10	-18V	Common Bus	Unregulated																																			10	Pin 5	#22 Wht/Blk
11			11	J102-1	#22 SLEEVED	11			11	J104-1	#22 SLEEVED	11			11	J106-1	#22 SLEEVED	11			11	J108-1	#22 SLEEVED	11			11	J110-1	#22 SLEEVED	11			11	J112-1	#22 SLEEVED	11			11		
12			12			12			12			12			12			12			12			12			12			12			12			12			12		
13			13			13			13			13			13			13			13			13			13			13			13			13			13		
14			14			14			14			14			14			14			14			14			14			14			14			14			14		
15			15			15			15			15			15			15			15			15			15			15			15			15			15		
16			16			16			16			16			16			16			16			16			16			16			16			16			16		
17			17			17			17			17			17			17			17			17			17			17			17			17			17		
			18			18			18			18			18			18			18			18			18			18			18			18			18		
19	J301-1	21-537	19	J104-19 J302-1		19	J303-1		J102-19	J106-19 J304-1		19	J305-1		J104-19	J108-19 J306-1		19	J307-1		J106-19	J110-19 J308-1		19	J309-1		J108-19	J112-19 J310-1		19	J311-1		J110-19	J114-19 J312-1		19	J313-1		19	J314-1	
20		Common Bus																																										

Module Plug-in Side



Wiring Side



J101 through J114
Elco 20 pin Connector
Mating Connector on Plug-in Module

SIGNAL CONNECTORS

	J201			J202			J203			J204			J205			J206			J207			J208			J209			J210			J211			J212			J213			J214		
FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE
A	—	—	A	—	—	A	—	—	A	—	—	A	—	—	A	—	—	A	—	—	A	—	—	A	—	—	A	—	—	A	—	—	A	—	—	A	—	—	A	—	—	A	—	—
B	—	—	B	—	—	B	—	—	B	—	—	B	—	—	B	—	—	B	—	—	B	—	—	B	—	—	B	—	—	B	—	—	B	—	—	B	—	—	B	—	—	B	—	—
D	J101-1	#22 W-BR-Y	D	J102-1	TYP.	D	J103-1	TYP.	D	J104-1	TYP.	D	J105-1	TYP.	D	J106-1	TYP.	D	J107-1	TYP.	D	J108-1	TYP.	D	J109-1	TYP.	D	J110-1	TYP.	D	J111-1	TYP.	D	J112-1	TYP.	D	J113-1	TYP.	D	J114-1	TYP.			
E	J101-2	#22 W-BN-GN	E	J102-2	TYP.	E	J103-2	TYP.	F	J104-2	TYP.	E	J105-2	TYP.	E	J106-2	TYP.	E	J107-2	TYP.	F	J108-2	TYP.	E	J109-2	TYP.	E	J110-2	TYP.	E	J111-2	TYP.	E	J112-2	TYP.	E	J113-2	TYP.	E	J114-2	TYP.			
H	J101-5	SH.	H	J102-5	SH.	H	J103-5	SH.	H	J104-5	SH.	H	J105-5	SH.	H	J106-5	SH.	H	J107-5	SH.	H	J108-5	SH.	H	J109-5	SH.	H	J110-5	SH.	H	J111-5	SH.	H	J112-5	SH.	H	J113-5	SH.	H	J114-5	SH.			

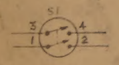
J200 through J214
Wiring Side
Amphenol #126-215
Mating Connector Amphenol #126-223
P1-1 through P1-14

SIGNAL CONNECTORS

	J301			J302			J303			J304			J305			J306			J307			J308			J309			J310			J311			J312			J313			J314		
FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE	FROM	TO	WIRE
1	J101-19	21-537	1	J102-19	TYP.	1	J103-19	TYP.	1	J104-19	TYP.	1	J105-19	TYP.	1	J106-19	TYP.	1	J107-19	TYP.	1	J108-19	TYP.	1	J109-19	TYP.	1	J110-19	TYP.	1	J111-19	TYP.	1	J112-19	TYP.	1	J113-19	TYP.	1	J114-19	TYP.
2 (Sh)	J101-20	SH.	2 (Sh)	J102-20	SH.	2 (Sh)	J103-20	SH.	2 (Sh)	J104-20	SH.	2 (Sh)	J105-20	SH.	2 (Sh)	J106-20	SH.	2 (Sh)	J107-20	SH.	2 (Sh)	J108-20	SH.	2 (Sh)	J109-20	SH.	2 (Sh)	J110-20	SH.	2 (Sh)	J111-20	SH.	2 (Sh)	J112-20	SH.	2 (Sh)	J113-20	SH.	2 (Sh)	J114-20	SH.

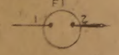
J301 through J314
Connector UG-198/U
Mating Connector (PO-1 through PO-14) UG-692/U

S1



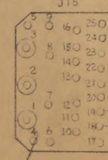
Power Switch (S1)		
FROM	TO	WIRE
1	P16-4	#22
	FAN-1	Wht/Blk/Grn
2	F1-2	#22
		Wht/Blk (Or)
3	P16-3	#22
		Wht/Blk (Bl)
4	J15-19	#22
		Wht/Blk/Yel

F1

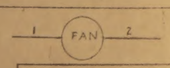


Fuse (F1)		
FROM	TO	WIRE
1	J15-18	#22
		Wht/Brn/Grn
2	S1-2	#22
		Wht/Brn/Grn

Wiring Side
J15



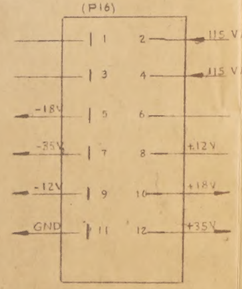
Cannon Connector DPX 25C3-34P
(P15) Mating Connector Cannon DPX-25C3-33S



Fan		
FROM	TO	WIRE
1	S1-1	22 Brn
2	S1-3	22 Brn

Main Connector (J15)		
FROM	TO	WIRE
1		
1 (Sh)		
2		
2 (Sh)		
3		
3 (Sh)		
4	GND	#18 BLK
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18	115 VAC	TO F1-1
19	115 VAC	TO S1-4
20		
21		
22		
23		

CONNECTOR VIEW FROM WIRED SIDE
(P16)



Elco Connector #RF-11224
(J16) Mating Connector = Elco Printed Circuit Connector or Board

Power Connector (P16)		
FROM	TO	WIRE
1		
2	S1-3	#22 Wht/Blk/Yel
3		
4	S1-1	#22 Wht/Brn/Grn
5	J114-10	#22 Wht/Blk
6		
7	J114-8	#22 Gy
8	J114-4	#22 Yel
9	J114-7	#22 Pur
10	J114-9	#22 Wht (Or)
11	J114-5	#18 Blk
12	J114-3	#22 Or

REFERENCE DOCUMENTS:

OUTLINE DWG. GOV-3, DO-003567-00

NOTES:

J200 + J300 SERIES WAS FORMERLY J1 + JO SERIES

CENTER CONDUCTOR
AMPHENOL #21-527 WIRE COAX
SHIELD

2 CENTER CONDUCTOR
TWISTED SHIELDED PAIR
#22 WIRE WITH BLK JACKET
CODE #CTXR-22-1934 HI-TEMP WIRE
SHIELD

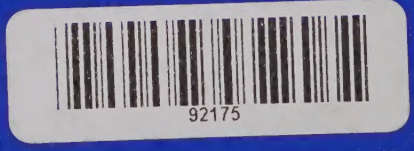
TYPE 1036
MODEL: GMH-1

DATA CONTROL SYSTEMS, INC.

WIRING CHART

DO NOT SCALE DRAWING

DWG. NO. DW-009551 SHEET 02


92175